MARINE REVIEW.

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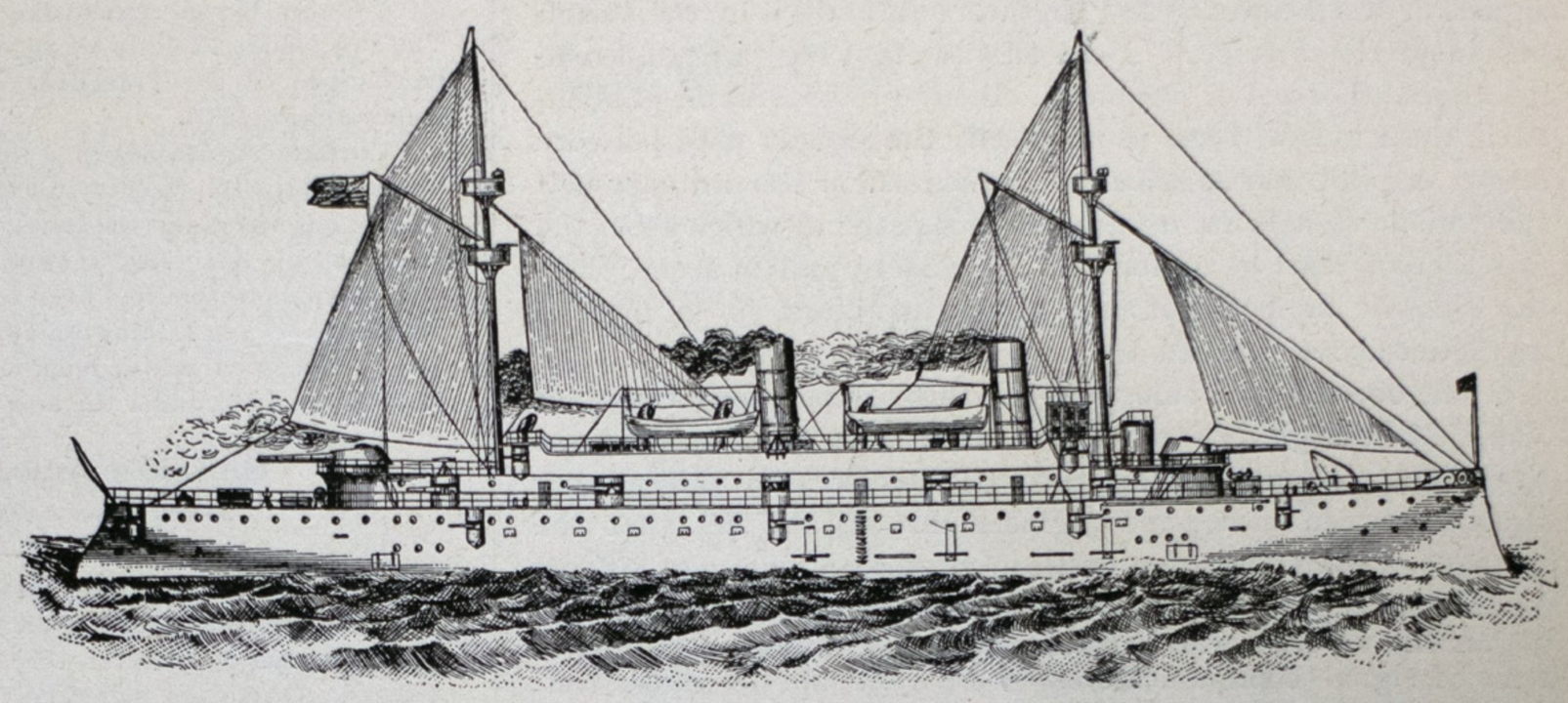
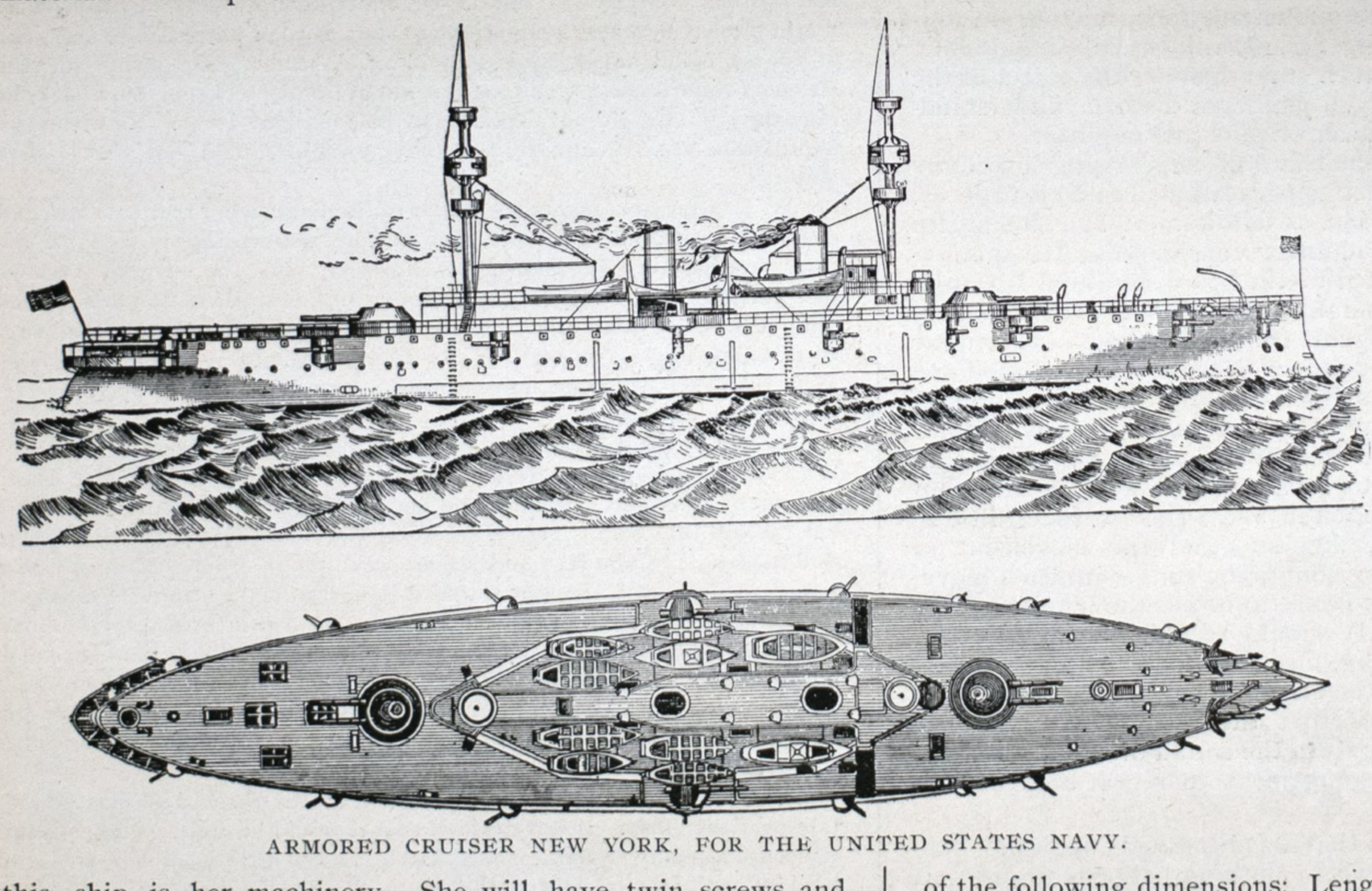
Naval Vessels.

The accompanying illustrations, reproduced from the report of Chief Constructor T. D. Wilson, of the United States navy, by the Railroad and Engineering Journal, of New York, show two important ships now under construction. The armored cruiser New York will be 380 feet 6½ inches in length on water line, 64 feet beam and will have a displacement of 8,150 tons, and a mean draft of 23 feet 3½ inches. The hull is to be protected by a vertical armor-belt over the machinery space, and by a steel protective deck from 2½ to 6 inches thick, extending from stem to stern. Within the armor-belt and above the protective deck a coffer-dam 3½ feet wide is to extend the whole length of the ship, and to be filled with some water-excluding material. An important feature of this ship is her machinery. She will have twin screws and will have four engines, two on each shaft, so arranged that the forward engines can be uncoupled and only the after engines used when cruising at slow speed. The engines will be of the vertical, inverted cylinder, direct-acting, triple expansion type, the cylinders being 32 inches, 46 inches and 70 inches in diameter, with 42 inches stroke. The valves will be all piston valves, driven by link motions. The bedplates will be of cast steel, and the engine framing will consist of cast steel inverted Y frames, two to each cylinder. There will be one condenser and one auxiliary condenser to each engine, and the circulating and air pumps will be worked by independent engines. Steam will be furnished by six double-ended boilers, of the horizontal return fire-tube type, each 15 feet 3 inches in diameter and 21 feet 3 inches long, and each having eight corrugated furnace flues 3 feet 3 inches inside diameter. There will be also two single-ended auxiliary boilers, each 10 feet in diameter and 8 feet 6 inches long, and each having two corrugated furnaces 2 feet 9 inches inside diameter. All the boilers will be built for 160 pounds working pressure. For forced draft there will be six blowers. These engines are expected to develop 16,000 horse power, and to propel the ship at a speed of 20 knots an hour.



CRUISER NO. 6, FOR THE UNITED STATES NAVY.



ARMORED CRUISER NEW YORK, FOR THE UNITED STATES NAVY.

Protected cruiser No. 6, which the Union Iron Works is now building in San Francisco, is a twin screw vessel of the following dimensions: Length on load water line, 340 feet; extreme breadth, 53 feet; mean draft, 21 feet 6 inches; displacement at normal draft, 5,500 tons. She will have two vertical direct-acting triple expansion engines, one to each screw. The cylinders will be 42 inches, 59 inches and 92 inches in diameter and 42 inches stroke. Steam will be furnished by six boilers, two single-ended, each 15 feet 3 inches in diameter and 10 feet 11½ inches long, with four corrugated tubular furnaces; the other four double-ended, 15 feet 3 inches in diameter and 21 feet 3 inches long, with light furnaces. They will carry 160 pounds working pressure. Working at full power and at about 128 revolutions per minute, the engines are expected to develop 13,500 horse power and to give the ship a speed of 20¼ knots an hour.

Telegraph and Electrical Systems of Signals.

PROPRIETORS MARINE REVIEW: I am in receipt of your letter of the 13th inst., and contents carefully noted. In reply to the query discussed before the Excelsior Marine Benevolent Association, namely, "Are the telegraph and electrical systems of signals between captains and engineers authorized by the steamboat inspection service?", I can only say that they are not directly either authorized or forbidden. In my previous letter published in the REVIEW, I had in mind only the signals used between master or pilot and engineer on vessels where the ordinary bell and whistle signals are used for such signals; in which case, the use thereof must be uniform on all vessels, and in accord with the rules of the board of supervising inspectors, as set forth in my letter above referred to.

The object of the rule, as set forth by Supervising Inspector Van Valkenburgh, of the Ninth district, who introduced it, was to prevent accidents arising through mistakes in interpreting signals between master and engineer, through the fact that the methods of communication between master and engineer differed on different boats. Therefore, a master and engineer coming together on one boat, who had been educated under contrary systems of signal communications, were very apt to cause accidents, which uniformity in signaling would prevent. The rule was passed in 1885, and, until recently, I had supposed had been entirely satisfactory, as no complaint to the contrary had ever reached this office. At the time of its passage, the question of dial indicators between pilot house and engine room was not discussed, for the reason, I suppose, that there were none then in use on the lakes. As the rule of the board was to prevent misunderstanding with the means then universally used, I do not think the spirit of the rule would be violated by the use of properly constructed telegraphic and electrical systems of signals having dials in the pilot house and engine room moving in unison with each other, making mistakes in signals impossible, thereby accomplishing in a much surer manner the object of the rule under discussion, namely, a plain and distinct understanding of signals between the master or pilot and engineer.

The only expression of the board of supervising inspectors bearing upon the subject under consideration, I find on page 12, proceedings of the board of 1889, as follows: "The committee on joint pilot rules, having had under consideration the communication of C. C. Roe, presented to the board by him, through the supervising inspector general, on the 16th day of January, 1889, relating to a mode of signals from pilot house to engine room, beg leave to report that we consider the device a good one for the purpose for which it is intended, and can see no objection to any steamer so desiring using the same or any similar appliance in connection with their present system of ringing bells." The device referred to consisted of a lever in the pilot house, which by a rod connection moved a similar lever in the engine room, each lever indicating on a dial the movement of the engine required, a warning gong being rung with each movement of the lever in the pilot house to notify the engineer that his services were required. It should be understood, however, that in all systems of signalling, electrical or otherwise, a bell or gong must be sounded in the engine room, as the law, Sec. 4480, revised statutes, requires that there shall be "tubes of proper size so arranged as to return the sound of the engine bells to the pilot house, or other arrangement to repeat back the signal."

In view of the discussion that has been had upon the subject matter of this letter, I shall, if nothing happens to prevent, bring it before the board of supervising inspectors at its next meeting, at which time I hope the parties most interested will, either personally or by letter, give the board the benefit of their opinions.

JAMES A. DUMONT,
Supervising Inspector General.

Two Steel Passenger Steamers to be Built.

Special Correspondence to the MARINE REVIEW.

WEST BAY CITY, MICH., March 19.—The Canadian Pacific Railway is receiving bids on two steel passenger steamers, and F. W. Wheeler & Co. who have just finished a car ferry for that company, will try to get the contract.

The barge Tasmania has received extensive repairs at the Bay City dry dock. The barge Antelope is being overhauled and receiving new decks. Tug Mocking Bird, which was burned at Cheboygan last season, is being rebuilt and will be completed about May 1. Tug Annie Moiles is receiving a new engine at Wheeler & Co.'s yard. The steambarge Benton is receiving steel arches, and being otherwise overhauled. The Benton was given quite a thorough repairing at the Bay City marine railway last season. Captain James Davidson will build a fishing tug for Alpena parties.

Captain Byron Armstrong will command the Soo City this season. The tug Justice Field is being rebuilt at Wheeler & Co.'s. Her name will be changed to the Traveller. This will be the second time this tug has been re-christened.

Christopher McDowell, a well known marine engineer, died at his home in Bay City, Monday morning. Mr. McDowell was one of the oldest marine engineers on the lakes, having been engaged in the business nearly all his life. Last season he was on the steambarge Geo. W. Roby, and previous to that had been for several years on the F. & P. M. steamers running between Ludington and Milwaukee. He leaves a widow and two sons. Deceased was a member of Bay City lodge F. & A. M. and the funeral was held under the auspices of that order.

Buffalo's Association in a Poor Way.

Special Correspondence to the MARINE REVIEW.

BUFFALO, N. Y., March 19.—It was intimated in this column last week that the recently organized Vessel Owners' Association of Buffalo would not make much progress on the line laid down by the Cleveland owners and some reasons therefor were given. The intimation already has been realized. Organized principally for the purpose of giving force to the movement to hold vessels in port until the middle of May, practically the association already has gone to pieces. True, it is hanging together yet, after a fashion, but its body has collapsed. About twenty owners and managers met last Monday, to further the hold-back plan. They furthered it out of sight. Capt. Frank Perew, president of the association, took the chair. He is sole owner of the big steamers A. P. Wright and J. B. Lyon. A pointed discussion showed that there were more interests connected with the scheme than could be brought together. Capt. M. M. Drake stated that the package freight liners could not be held back because they had railroad contracts to fulfill. Of individual owners, he said, some might already be under obligations to start as soon as possible, and such of course could not be asked to hold off. As managing owner of the steamers America and Brazil, he was not at liberty to keep them back, he remarked, but he did not explain why he could not do so. Nevertheless, Capt. Drake was very anxious that other owners should not start before May 15.

W. H. Gratwick, managing owner of the Gratwick, Fryer and Mitchell and the Edward Smith lumber tow, said he was willing to sign for the three first named. The Smith tow, however, must be left out, because they carried lumber only for their owners from Oscoda to Tonawanda, and did not interfere with other vessels. The steamer Northerner and consorts, being under contract for ore from Escanaba to Tonawanda, also were to be excluded from holding back. And so were developed the elements to an agreement.

By and by Capt. Perew called Capt. Thomas Maytham to the chair. With a full head of steam he let himself out. He denounced the whole movement as a farce, said he would have nothing to do with it, put on his hat and left the room. Then Capt. John Green, owner of the S. E. Peck, said it seemed to him an adjournment would be in order. Most of those remaining, however, thought it would be best to make a show of trying to do something. Capt. Green said there was no use in attempting to fool owners at other ports, "and you can count me out." Capt. John Rice also got disgusted with the turn of affairs, and left the meeting. Then Capt. Drake, who had nothing to hold back, moved that it is the sense of the meeting that it would be wise for owners not to start before May, and this was declared adopted.

On Tuesday the executive committee of the association had further talk over the affair. It was decided that it would be well, in any event, to secure as many signatures as possible to the Cleveland agreement to hold off until May 15. Of course there is no harm in this, but it is certain that no good will come therefrom. Capt. Perew and Capt. Green will not sign under any circumstances, and there are others here who will not bind themselves even by name. No matter what owners at other ports may do, the Buffalonians will not work together. It is pertinent to remark again: The vessel interests of the lakes now are so large and so varied that they cannot be brought together on any basis like the one proposed. Take the case of the America and Brazil. It is understood they are under charter to load wheat at Duluth promptly on the opening of navigation at 2¾ cents freight. It certainly is a question whether damages could not be got should a boat be an unreasonable length of time in carrying out a contract. The boats already loaded with grain at Chicago and those contracted to carry lumber and ore all would come under this limitation. And so would the railroad line steamers.

There is little possibility of Capt. Perew's having anything more to do with the association. Secretary Keep resigned, and C. H. Woodruff

was elected to succeed him. He will not accept the position, however. While it is conceded that the movement to hold Buffalo vessels back is a failure, there is a feeling that the association ought to be kept up to bring about a uniform action in the many other important matters affecting owners in common—"like the Cleveland association." Plainly it would be wise to do this ; but just as plainly there is little prospect of its being done.

The Northern line steamers will start as soon as the channels are open. Manager Gordon is anxious to see them under way. The Emily P. Weed yet may run in that line. Were it not for that probability, her owners would have had less objection to sending her to the coast.

Last week, Patrick Hickey got a verdict for $500 against the owners of the steamer W. H. Barnum. In August, 1889, he fell through a hatch from the upper to the main deck, sustaining a slight concussion of the brain. He was a scooper, and had helped in unloading the steamer's grain cargo. The accident happened just after she had finished, and Hickey had come up the very hatch through which he stumbled. An appeal will be taken on the ground that he had been working as an employee of the boat, and that the accident was the result of his own carelessness. Hickey was laid off only a few months.

First Launch of a Metal Boat on Lake Michigan.

Special Correspondence to the MARINE REVIEW.

CHICAGO, Ill., March 19.—A special train of seven coaches pulled out of the Pittsburg, Ft. Wayne & Chicago Railway depot, Saturday noon, carrying with it an enthusiastic delegation of ladies and gentlemen enroute for the yards of the Chicago Ship Building Company at 101st street and Calumet river, where the launch of the Minnesota Steamship Co's steel steamer Marina took place. Every vessel in winter quarters in the vicinity of the yards carried its streamers of bunting. More than 3,000 people witnessed the launch. Many of those present were marine men or interested in marine matters. The E. M. B. A., branch No. 3, was there in force and presented a fine appearance with the badges of their order pinned to the lapels of their coats. Among those present were: Mayor Cregier, Fire Marshal Swenie, Mrs. A. C. Myers, World's Fair alternate, A. W. Goodrich, Joseph Austrian, George Gilman, C. W. Elphicke, W. M. Egan, Charles Myers, John J. McCarthy, Asa F. Leopold, Captain J. G. Keith, Peter White, of Marquatte, Alderman Dunham, Capt. Ladner, Capt. J. L. Vance, Capt. Holmes, Capt. Davidson, and Wm. R. Sterling, vice-president of the Illinois steel works. The christening ceremony, performed by Mrs Babcock, wife of Manager Babcock of the shipyard, was made impressive by the number of distinguished gentlemen in attendance. Mrs. Babcock in breaking the bottle of champagne over the vessel's bow was surrounded by Mayor Cregier, Mrs. F. F. Wormer, Luther Allen, John F. Pankherst, Fire Marshal Swenie, John H. Smith and Manager Babcock. The Marina is the first steel vessel ever built on Lake Michigan. Her length is 308 feet, keel 292 feet 6 inches, beam 40 feet and depth 24 feet 6 inches. Her keel was laid last July. The Marina is designed for the ore trade. The Chicago Ship Building Company deserves much credit for its finished work. The company employs 350 men and has facilities for the building of much larger vessels. They own twenty-two acres of yards, eleven only of which are utilized at present. Another vessel belonging to the Minnesota Steamship Company, the Mesaba, is nearing completion and will be launched within six weeks. While the outfitting of the Marina was let to several bidders it is generally thought that George B. Carpenter & Co., of this city, secured the lions share of the business. Captain John McArthur, of South Chicago, who died on F iday last was a lake captain for many years. He had but recently been appointed commander of the steamer New York.

The Timber Trade—Canadian Marine.

Special Correspondence to the MARINE REVIEW.

KINGSTON, Ont., March 19.—During the past week owners of vessels that have been engaged in the timber trade looked about them for charters, but thus far they have been unsuccessful, and the prospects are that they will have to engage in some other trade during the coming season. The vast quantities of timber at Quebec still remain unsold, and in this city Calvin & Co. have three rafts ready to be sent down the river on the opening of navigation. Some firms cut and carry their own timber. These firms, it is announced have not cut sufficient to employ more than one-third of their fleets, hence it can be seen what a poor outlook there is for outsiders to get even a piece of the carrying business. Some other trade may prove brisk and give employment to surplus tonnage.

The improvements being made on the mail steamers Spartan and Corsican at this port will cost over $21,000. The work is being pushed ahead rapidly. The Queen of the Lakes, of Kingston, is now lying at Charlotte, where she is being fitted out by Capt. Parsons, her owner. The improvements on the Norseman, which runs across the lake to Rochester, will be on such an extensive scale that her name will be changed.

A sale of the steamer Kathleen took place here under strauge conditions. A company wanted her for service on the Georgian Bay. The conditions were that if the conservative government was returned to power the company would buy her ; if not she would remain here. She was sold and the sum paid was $10,500, about half what she cost the builder, W. Bajus.

Last year the government expended in improving the Cornwall canal the sum of $365,038 and on the Sault ste Marie $176,760.

Nothing further has been heard about the proposed elevator here. One thing is certain: If Kingstonians don't hasten themselves and the government too it will be some time before the elevators are secured. The fact that the New York Central has leased the Rome & Watertown R. R. has caused regret in Kingston, as it will kill the project to build a new line to Cape Vincent, just opposite this city.

Grand Haven Information.

Special Correspondence to the MARINE REVIEW.

GRAND HAVEN, Mich., March 19—The new steamer for L. B. Coats, of Chicago, is receiving the finishing touches at Robertson's yard. Mr. Coats designed and built her expressly for the purpose of gathering the catch from the different fishing stations on Lake Superior. She is 77 feet over all, 17 feet beam and 8 feet hold. Her engine is 14x16, built by H. Bloecker & Company, of this city. She has cabins for crew below decks both fore and aft. The fish tug building for Milwaukee parties will be ready for sea this week. Capt. Kirby contemplates inaugurating a new feature in the fishing business at this port. He has built and filled a large icehouse and will freeze some fifty tons of fish the coming season. If the business proves profitable he will build two more fish tugs the coming winter. The passenger steamer Joe will be fitted with triple expansion engines, which he thinks will enable her to make eighteen miles per hour. She will be used to pick up and bring the fish here from different points on the lake where his fish tugs may be located. The towing tug McComic he offers for sale. He intends to keep for a private yacht the steamer Sprite.

James Van Patton, formerly master of the Sachem will go in the steamer Ionia. She is being fitted with steam steering gear. The steamer Street is having three new hatches put in and passenger steamer Crescent gets a new deck. Chief engineer Barron has arrived from Detroit and is fitting out the City of Milwaukee.

Hugh Gillen, of this city, superintendent of government improvements at Waukegan and Milwaukee, left for the latter port this week, his son taking charge at Waukegan. White & Friant have a contract for dredging 45,000 yards at Green Bay and will send one of their dredges and two scows there as soon as the weather permits.

Detroit River Gossip.

Special Correspondence to the MARINE REVIEW.

DETROIT, MICH., March 19.—The question of wages for the ensuing season of navigation has, during the past week, received a good share of attention from both men and employers. A quite thorough inquiry into the subject convinces me that the Cleveland scale will be adopted by nearly all owners in this vicinity.

A couple of grain charters are reported. The schooner Nassau loaded wheat last week for Ogdensburg at five cents. She was afterwards discovered to be leaking and the wheat was discharged. One hundred and thirty-two bushels were found to be wet. The vessel is being repaired and the cargo will again be taken on board. The schooner Lem Ellsworth loaded wheat this week for Oswego at four cents. The above figures include storage on vessel until the Welland canal opens.

The steambarge H. S. Pickands, which was reported last week as having been sold under mortgage foreclosure, and bid in by C. L. Ortmann, has since been bought by A. Chesebrough, of this city. The figure paid is withheld, but is understood to be very low, much less than her last year valuation in Lloyds, which was $55,000. The Pickands will this season tow the schooner Marengo, which vessel is also owned by Mr. Chesebrough.

Condition of Water and Ice at the Sault.

Special Correspondence to the MARINE REVIEW.

SAULT STE. MARIE, March 16.—It is generally understood here, although not on account of any official statement being made by the canal officers, that the water is four inches lower than at this time a year ago.

Lake Superior navigation will certainly not open earlier than last year. The ice in the immediate vicinity of this section is more solid than at any time during the winter; in Hay lake it is from 16 to 18 inches thick and it is not less than 20 inches in Mud lake. The rains of the past two weeks have slushed the large quantity of snow, and recent cold weather following has frozen it solid, making snow ice which is least impervious to the sun's rays. Open water at Detour is visible off the light house point and the light north-west winds of the past week have filled Whitefish bay with heavy floating ice that can only be driven out by south-east winds, if heavy freezing weather does not set in. The discharge valve in the canal lock which caused the delay to traffic last summer is being duplicated and every bolt and nut is being thoroughly overhauled under the personal supervision of Supt. Martin Lynch.

The Outlook in Lumber.

There is little in the way of an understanding regarding freights between lumber shippers and vessel owners. The movement will be heavy, as sales have been active, but some of the poorer class of ore and coal carriers will seek refuge in the lumber trade, especially from Lake Superior, and shippers are accordingly talking of reducing the opening rates to a basis of $1.50 from Bay City to Buffalo and Tonawanda. This would be 25 cents below the rate of a year ago, but vessel owners do not as yet agree with this view of the situation. Shippers are still decidedly opposed to the plan of the Saginaw Valley Vessel Owners' Association to have all lumber placed free on rail and the outcome of this important question will be watched with interest. It is reported that the Canadian Pacific Railway is tapping the lumber regions in the Sault district and has already secured 20,000,000 feet at Bay Mills, which, if it proves true, will make quite a difference in the season's business. It is conceded that for eastern points not reached by canal or lake, this road can carry lumber as cheap as the barges. The Ashland News says that the actual amount of lumber from the district at the head of Lake Superior already purchased by Chicago parties is about 30,000,000 feet, 10,000,000 of which is last year's stock, the other 20,000,000 feet being of the coming season's cut. It also claims that at present there are fully 50,000,000 feet of first class lumber on the different docks on the bay that is for sale, while the major portion of the present season's cut, which at the lowest estimate is 200,000,000 feet, remains unsold and ready for purchasers.

The Sailors' Snug Harbor.

In answer to an inquiry from a correspondent it can be said that lake sailors are not admitted to the Sailors' Snug Harbor, the Staten island institution of great fame. The persons for whose maintenance and support the asylum was established, are described in the will of its founder, and also in the act of incorporation as "aged, decrepit and worn-out sailors." No person is admitted who is afflicted with any contagious disease, or who is possessed of adequate means of self-support, either by his own labor or from other sources. Or, if a foreigner born, who cannot furnish satisfactory evidence of his having sailed for at least five years under the flag of the United States, either in the merchant or naval service. Every applicant must present letters from at least two parties for whom he has sailed showing him to be eligible for admission to the institution under the above rules, stating how long he has sailed for them, and that he is unable to obtain a livelihood for himself. Applicants must apply in person at the agent's office, No. 74 Wall street, New York.

An Old Time Admiralty Case.

Capt A. W. Rossman, who is superintending the building of the Atlanta at the Cleveland Dry Dock Company's yard and who will sail her when completed, tells of the following experience, which occured when he was sailing the brig Illinois, thirty years ago. Some of the crew got drunk at Milwaukee and were discharged. In revenge they made a claim for wages and the sheriff went aboard the vessel to tie her up. Capt. Rossman was aboard the tug, the only one in Milwaukee, which started to tow the vessel out as soon as the sheriff set foot on deck of the Illinois. When outside and clear of legal jurisdiction the captain was put aboard his vessel. The sheriff served the papers, but the captain ignored him. Of course, he was sorry he couldn't land until they reached Racine where he had a few barrels of salt to put out. The pier at Racine ran outside several hundred feet and the brig was put alongside without trouble But Racine was under the same authorities as Milwaukee and the sheriff went up the piers to get assistance in capturing the buccaneer. In course of a half hour the sheriff returned with a crowd of thirty or forty men. The salt was unloaded and the topsails had been left up and the wind was off shore. The lines were thrown off and the brig moved away from the pier. Then the sheriff returned to Milwaukee and fell upon the tug. The matter came into court and the claimants held that the tug was responsible for towing the vessel out when the officer was aboard. Then came a crushing defense. It was shown to the satisfaction of the court that the tug had a line to the brig and also had such a head of steam that the throttle had to be opened and the tug started in order to prevent a disastrous explosion. Therefore it was held that the tug could not be made responsible.

Mr. Pennington on the Steering Question.

EDITOR MARINE REVIEW:—Much has been said and written in regard to the necessity of uniform steering; necessity if confusion and disaster, frequently resulting from the use of two systems, is to be avoided. In order to preface and make plain the points I shall endeavor to make in this article, I shall here state the two methods in use on the lakes with their respective commands, viz:

Steering as a vessel, straight chains—Command, "Starboard!" wheel is put to port, rudder and bow come to port. Command, "Port!" Wheel is put to starboard, rudder and bow come to starboard.

Steamer steering with crossed chains—Command, "Starboard!" Wheel is put to starboard, rudder and bow come to port. Command, "Port!" Wheel is put to port, rudder and bow come to starboard.

So it will be seen that in steering with straight chains the wheel, the rudder and the bow are turned in the same direction, while with cross chains the rudder and bow turn in the opposite direction from the movement of the wheel. In all cases however the command is the opposite from the change of course desired. It will also be observed that when steering with cross chains, the command and the direction of the wheel agree, while with straight chains they differ. Yet in each case the command is the opposite to which the bow and rudder are to be turned. Now, any system that may be adopted generally, to bring about uniform steering, will fall short of the best results, if it does not include also the command of the officer to the wheelsman.

At the International Maritime Conference held in Washington, D. C., in January, 1890, Mr. Goodrich, of the United States, proposed the following amendment to the "sailing rules:" "The command 'starboard' shall mean that the wheel, rudder and bow of the vessel are to be turned to starboard; and the command "port" shall mean that the wheel, rudder and bow of the vessel are to be turned to port." Mr. Goodrich urged adoption of this amendment, and claimed that "it would simplify matters and make a uniform method of ordering, among all the maritime nations." Capt. Malmberg, of Sweden, stated that the system was already in use in Swedish, French, Austrian and Italian vessels. He said: "When we say 'starboard' we mean that the ship's head is to be turned to starboard, and when we say 'port' we mean that the ship's head is to be turned to port."

The foregoing is high authority for the change of steering rules, so that the command, the direction of the wheel and the turning of the rudder and bow of the craft, may be in agreement. The discussions on the lakes as to "uniform steering" have had a narrower scope, and only involved the question whether there should be uniformity between the motion of the wheel and the direction of the rudder and bow, on all lake crafts, as is now in vogue on sailing vessels. The factor of "command" has not, so far, entered into the discussion, and perhaps it had better not for a time. There are two systems in vogue—one of them should give way to the other for the sake of uniformity. That is, perhaps, as radical a change as should be made at one time Sailor men have inherited the old methods, as we inherit our superstitions, and accept them as a matter of course. They get used to a method and its operation becomes automatic, and however absurd it may be in theory, the wheelsman guides the ship in safety. But when he ships on a boat using another system, he "automatically" turns the wheel in the wrong direction, and an expensive disaster possibly ensues.

I suppose the driver of a team on the public highway could, with his lines crossed soon learn to drive with safety, and if driving was done in no other way it might be safer to so continue. But if a simpler and more reasonable method was also in use, what sane man would not say there should be uniformity and that the former method should give way to the latter. The method of steering in use on vessels is more reasonable in that the bow and rudder obey the direction of the wheel. Furthermore, sailing vessels cannot change their method except at a large expense; therefore the uniformity of steering, so much desired by all, must come about by all steamers adopting straight chains. After this is done and all wheelsmen get used to the change the factor of the "command" should, in my opinion, be taken into the account, by the adoption of the more simple and rational system now in use on Swedish, French, Austrian and Italian vessels.

B. L. PENNINGTON.

Eleven hundred years or more before Christ some ingenious Chinaman, it has been affirmed, invented the mariner's compass. A writer in the *China Review*, who has been investigating the subject, now asserts that the first unmistakable mention of the compass in the Chinese records is not earlier than the twelfth century, and the instrument undoubtedly became known in Europe efore the return from China of Marco Polo, who is fabled to have bronght it in his baggage.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St.

Stocks.	Par Value.	Bid.	Asked.
Cleveland Iron Mining Company	$ 25 00	$ 15 00	$ 17 00
Champion Iron Company	25 00	90 00	100 00
Chandler Iron Company	25 00	39 00	40 00
Chicago and Minnesota Ore Company	100 00	.....	110 00
Iron Cliffs Iron Company	50 00	.....	120 00
Jackson Iron Company	25 00	90 00	100 00
Lake Superior Iron Company	25 00	65 00	68 00
Minnesota Iron Company	100 00	70 00	80 00
Pittsburg Lake Angeline Iron Co	25 00	145 00	.....
Republic Iron Company	25 00	27 00	29 00
Michigamme	25 00	8 50	10 00

The larger mining companies are still making extensive improvements. One of the Lake Superior papers says of the Champion: "A new compressor is due at the mine. The present one is a thirty-drill compressor but is carrying forty-five machines and there is work to do for sixty. The work of reinforcing the hoisting plant will be completed about the middle of July. More economical service in that branch of the work can be secured when that improvement is complete. The present plant is adapted to the economical hoisting of one ton of ore per skip from a depth of 1,000 feet, but is hoisting two tons from a depth of over 1,000 feet. The new drums will be much larger. They will hoist from the deep shafts. The old plant will be somewhat remodeled to eliminate much of the friction and will hoist from the shafts which have not attained great depth.

Recent reports from the gold companies of the upper Michigan peninsula, in which many of the owners of iron mining properties are interested, would indicate that their future is not very bright, although a great deal of money has been spent in them. The results of the milling of 600 tons of rock from the Michigan mine was unsatisfactory to the directors, and the work was stopped after that amount had been treated. A special meeting of stockholders will probably be held at an early date, and a course of action for the future will be determined upon. There is considerable good stoping ground in the mine which can be worked out at a profit before the mine is abandoned, if that course is determined upon. An assessment of 25 cents a share, $20,000 in all, was recently levied on the stock of the Ropes mine to provide a working capital for the coming year.

Development work on the new Mesaba range, Minnesota, is still very active, notwithstanding the poor outlook and the lack of railway facilities to care for the ore of properties that give promise of being profitable. Newspaper reports from the new districts are as flattering as ever. It is said that the Mountain Iron Company's mine a body of ore in sight is estimated to contain 1,200,000 tons. It is 700x350 feet and consists of soft hematite ore of the Bessemer grade, averaging 65.8 per cent. metallic iron and about .042 phosphorus. The ore is struck at from fifteen to thirty feet below the surface, and a large amount of it could be shipped this year if railway facilities were provided.

The Chandler mine is evidently making great progress in preparations for heavy shipments during the coming season. The shaft on the north addition, leased recently, is about 30 feet in ore, and No 2 shaft has been completed to the sixth level. The work of timbering on this shaft will begin immediately and it will be sunk another 75 feet to the seventh level. At the opening of navigation both levels will be worked. There is, of course, large quantities of ore to be taken out of the upper levels of this shaft as well as shaft No. 1.

The Pewabic mine, Menominee range, gives promise of big shipments in future. The mine now has about 16 000 tons of ore in stock and is producing 300 tons a day with a force of 325 men The product will be largely increased when a new hoisting plant, compressor and big pumps now on the ground are placed in operation.

Mr. J. V. Painter, director in the Republic Iron Company, says in renewing his subscription to the MARINE REVIEW: "I am not directly engaged in lake business but I take the MARINE REVIEW because I think it has been an excellent publication from the outset and is deserving of the support of everybody who has any interest in Lake Superior ore or the other branches of trade connected with lake commerce."

Proposed Changes in the Hull Tariff.

The general agents of the insurance companies doing business on the lakes who were to have met in Chicago on Tuesday last, postponed their meeting until next Tuesday, the 24th inst. It is probable that the general agents want a little more time to consult with the heads of their companies. The demand of the Cleveland Vessel Owners' Association for an April deduction of 20 per cent, instead of 10 per cent., and for an extension on all policies to Dec. 5 at noon was probably a surprise to the under writers. But there are also other important matters to come up at the meeting that demand careful attention. It is more than probable that valuations in the Inland Lloyds Register will be reduced all along the line. The cause of this is a fear on the part of the underwriters that the depressed condition of the lake business may cause a great many boats to be left upon their hands. Tendency, too, is to again mark up rates on A2 vessels, The claim is that A1 vessels are still paying more than their share of the losses. Another feature of the tariff that will demand attention is the collision clause. It is generally believed that the rate of three-fourths of one per cent., which ruled last year,will be increased noticeably on account of the large number of losses sustained through insurance against collision liability last season. It has also been proposed that the underwriters make a separate collision policy, covering only collision liability and loss to the vessel from collision causes. Insurance of this kind might be taken by such owners as Bradley, Wilson and Gilchrist, of Cleveland, whose boats are covered only in a small way, if at all. Now that there is hope of vessels remaining in port later than May 1, the vessel owners will not be satisfied with asking for the 20 per cent. deduction on April alone. Mr. Pennington, who has been appointed to represent the Cleveland association, will ask for a proportionate allowance for the first half of May. Whether their request will be granted or not remains to be seen. The insurance journals contain reports of many failures at Lloyds and the lake underwriters seem less troubled than they were a year ago about competition from the foreigners. There are two sides to the request of the vessel owners in the demand for an extension of policies to Dec. 5. It is true that the last trips of the fall are with grain and that good rates are paid, but shippers who will know of the insurance extension will make their rates accordingly. It is hardly probable that the underwriters will grant this extension.

The Whale-backs and Pacific Coast Development.

A. D. Thomson, Duluth grain shipper, has an interest in the American Steel Barge Company and is inclined to boom its affairs. On returning from a southern trip a few days ago he was quoted in Baltimore as saying that the barge company would send seven boats to the coast in the spring to work in connection with the Baltimore & Ohio Railway and that arrangements had also been made with the B. & O. for its lake trade. This is all talk. Only two of the boats will go to the coast and the others will engage in carrying the ore of the Colby syndicate on the lakes. One of the boats going to the Pacific coast will take on a load of grain which will first be delivered in England. The cargo will, of course, be taken out entirely during the boat's passage down the St. Lawrence from Kingston to Montreal. Although the barges are of light draft, they can carry no cargo in running the rapids.

The officers of the barge company present a sound view of the future in planning to establish a shipyard on the Pacific coast. Nowhere in the world are coal or ore cargoes handled with the rapidity that characterizes this business on the lakes and some of the methods and machinery in use here would work well in a growing country like the Puget sound district. The United States government is about to establish a navy yard on Puget sound, and at Vancouver, B. C., a dry dock is about to be constructed that will be one of the largest in the world and will cost more than a million dollars.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

JOHN M. MULROONEY, ... } PROPRIETORS.
F. M. BARTON, ... }

Published every Thursday at No. 510 Perry-Payne Building, Cleveland, O.

SUBSCRIPTION—$2.00 per year in advance. Advertising rates on application.

Annual tonnage entries and clearances of the great seaports of the world, for 1889: New York, 11,051,236 tons; all seaports in the United States, 26,983,315 tons; Liverpool, 14,175,200 tons; London, 19,245,417 tons.

Entered at Cleveland Post Office as Second-class Mail Matter.

THE Chicago city government has begun the construction of a bridge across the south branch of the river at Canal street, the middle pier of which according to the government engineer stationed at Chicago is "an unreasonable obstruction to navigation." The engineer has reported the facts to the authorities at Washington, but the Chicago Tribune fears that it will be necessary to have the entire commercial interests of the lakes petition congress for the passage of an act to remove the pier. This will not be necessary, however, if the navigation interests of Chicago proceed in the right manner. The Tribune's fears are based on the decision of the supreme court about two years ago with regard to the closing of bridges over the river during certain hours of the day. The supreme court decided at that time that unless congress should interfere by legislation the federal government had no power over the Chicago river. By the river and harbor act passed Sept. 19 last, however, the secretary of war was given jurisdiction over just such matters as that which now agitates the Chicago vessel interests, and it behooves the Chicago Vessel Owners' Association to present their case to that official. Cleveland now has a similar bridge question before the war department and a commission of eminent army engineers are at work upon it with fair prospects of two railway companies being compelled to remove obstructions authorized by the city council.

THE Engineer, of New York, radical in many respects but very ably edited, throws out a left-handed compliment to the MARINE REVIEW in return for a courteous recognition of its enterprise in printing a full report of the recent convention of marine engineers in Washington. The Engineer would intimate that the displeasure of lake vessel owners in this neighborhood is a bar to the publication of what is news to them. The MARINE REVIEW may be depended upon at all times to give publicity to official actions by both the engineers and their employers, but a little early training in journalism, under good tutors—if the venerable editor of the Engineer will permit of a modest criticism—has taught us that a careful wielding of the club put into the hand of every journalist is at all times best. Especially is this true when the question is so important as that of wages. The engineers have had some difficulties with their employers but they seem capable of working out their own case and the level heads among them are not slow in so informing those who have interfered with the conservative course so far pursued by them.

THE supervising inspector general of steam vessels is evidently desirous that there shall be no misunderstanding regarding his interpretation of the "strong" signal in the code of engine signals prescribed for the lakes. As shown by a letter from Gen. Dumont in a recent issue of the REVIEW the "strong" signal is one long whistle or four bells; not four whistles. The master who pulls four whistles violates the law according to this ruling, and the inspector general has just issued a circular containing the code of signals which confirms his position. It is advised that a copy of the circular be kept posted in the engine room and pilot house of each steamer on the lakes. Copies will be supplied by the local inspectors.

The Outlook in Freights.

The small block of ore, 250,000 or 300,000 tons, sold by two Cleveland dealers a fortnight ago at about a dollar a ton less than last year's price, is apparently of little importance in considering the outlook for the vessel interests. No ore has been sold since and none of the big furnace owners have as yet come into the market as purchasers. Many of the leading vessel owners look for an opening of navigation with but few season contracts in ore and they would be as well satisfied to let their boats run wild. Ore is moving to the furnaces more freely, especially from Ashtabula and Fairport, where the dock space is now somewhat greater than it was at this time a year ago. The movement from the Cleveland docks is not so encouraging, however, as the supply from these docks goes mainly to the Mahoning valley, where the furnaces have been banked for several weeks past. Duluth grain shippers are only offering 2¾ cents on wheat to be loaded for Buffalo immediately upon the opening of navigation. It has been said that several boats have been chartered at this figure, which is equal to only $1,02⅔ on ore from Ashland, but it can not be learned that any Cleveland boats have accepted it, and the only crafts known to be under charter are the steamers America and Brazil, of Buffalo.

There is, of course, a great deal of uncertainty about the movement to hold boats in port until May 15. The scheme has met with a decided set-back in Buffalo but it might be carried out without the assistance of the few wild carriers owned in that city. The strongest support is found among owners of ore carrying vessels and the ore shippers. It would not be surprising if some of the ore shippers would refuse to give vessels ore previous to May 15.

Measures to be Considered by Lake Masters.

The adjustment of such questions as uniformity in steering and the proposed change in steamboat rules, which now prescribe one blast of the whistle as a porting signal as well as a fog signal, belongs properly to the masters of lake vessels. The importance of a change to uniformity in steering and the emancipation of the porting signal from all other signals is fully appreciated by the Excelsior Marine Benevolent Association, an order made up of lake captains. The Lake Carriers' Association, the organization of owners, did not give these matters the attention of which they are deserving at its recent meeting. The owners left the steering question practically as it has been for all time past and the existing danger from a similarity in the porting and fog signals was not even spoken of at their meeting. In view of this situation it behooves the masters to see, before quitting their regular meetings this spring, that everything is in readiness to bring these subjects before the board of supervising inspectors at its meeting next winter.

Capt. Wm. P. Henry, general manager of the Lehigh Valley Line, who was, unfortunately away from Buffalo when the annual meeting of the Lake Carriers' Association took place, is himself a navigator and, of course, adheres to the straight chain system. He was disappointed in finding that the meeting had taken no action in the matter, and advances a new feature in the argument favoring straight chains in a recent letter to Capt. McKay. He says: "You know that all vessels carrying sail, either steam or otherwise, must steer with straight chains. In the first place the man must stand to windward to enable him to see the ship's head, and, as all vessels carrying sail in a fresh breeze have a tendency to gripe to windward the wheelsman must stand where he can turn the wheel from him instead of towards him, to prevent the ship griping to windward. This movement requires a great deal of physical strength, as every man knows who has ever turned a wheel. In heaving the wheel from him he is enabled to display strength, but where the chains are crossed and he has to pull the wheel forward you can readily see he would be helpless and would be thrown over the wheel and probably have his neck broken. I think we can go before the board of supervising inspectors, or before congress, and ask for a law making the steering uniform, taking the 80 per cent. or more, that we have on the lakes who are in favor of uniformity of steering. We can also present the reason why uniformity of steering should be compulsory, and show why none other than straight chains can be made uniform."

Excelsior Marine Benevolent Association.

The brave act of Mabel Mason, daughter of the keeper of the Mammy Judy light station, Detroit river, in rescuing a man from drowning last summer will be remembered. The girl, fourteen years of age, was alone at the light station when Capt. Montague, of the steamer C. W. Elphicke, running down the river cried out that a man had fallen into the river from a small boat that had capsized. She put out with a boat from the island and brought him safely to shore. The lake newspapers applauded her action and it is probable that it will be recognized by a medal from the goverment when testimony is properly presented. The government is slow in recognizing acts of this kind, however, and in the meantime the Cleveland organization of masters has secured for Miss Mason a medal attached to a neat solid gold necklace and bearing the inscription, "Presented to Mabel L. Mason for heroism in her fifteenth year, by the lake masters' lodge, No. 4, E. M. B. A., Cleveland, O." Miss Mason has been ill for several weeks with a fever but is recovering.

The Milwaukee lodge, infant branch of the order, now has a membership of fifty and applications enough on file to increase the number to sixty shortly. Thomas Otter, John Wright and William Lund were initiated last week. A library and club room in addition to the present lodge room are contemplated. The fleet laid up in Milwaukee is a large one and Secretary L. R. Vance assures all members of the order that they will be welcomed at the quarters of the new lodge when fitting out their boats in Milwaukee.

"American Lake Steamers and Foreign Going Vessels, with Rudimentary Notes on Stability and Casualties in Foreign Waters," was the subject of a paper by Joseph R. Oldham, N. A., at Saturday's meeting of the Cleveland branch. The paper will be printed in full in the next two issues of the REVIEW.

Capt. E. C. Maytham was last week initiated into membership of the Buffalo lodge. The lodge has been presented by the Dunham Towing and Wrecking Company, of Chicago, with a handsome silver water urn, with tray and goblets. It now has 152 members.

Capt. D. M. Pierce, president of the Bay City lodge, was presented with a beautiful cane by the members. John Shean and James Bennett carried off the honors in a pedro party that followed and a repast was served to crown the pleasure of the evening.

Capt. James Stone, of the Bradley fleet, has the sympathy of many friends on the lakes in the loss of his wife. A delegation from the Cleveland lodge accompanied the remains to the railway depot, Tuesday. The burial was in Vermillion.

Capt. John N. Griffin was elected to membership of Port Huron branch, No. 2, at the last meeting and several others will be elected at the coming meeting.

Cleveland Matters.

Bids for furnishing materials and constructing 1,800 lineal feet more or less of pile protection in Maumee bay along the line of the proposed straight channel at Toledo were opened Wednesday by Major Overman and are as follows: Steiner & Griffin, Detroit, $27,737, John Kelley, Guttenberg, N. J., $20,911; John Stang, Lorain, $23,491.50; L. P. & J. A. Smith, Cleveland, $23,606.

Carkin, Stickney & Cram's bid of $14,600 for removing and rebuilding a portion of a pier at Ashtabula was the only one received by Major Overman. Another call will be made for proposals.

Capt. W. Dandy, late master of the schooner B. W. Folger, of Kingston, will sail the coming season the schooner J. F. Card, of Detroit.

John C. Fitzpatrick, of Mitchell & Co., is now controlling owner in the propeller George T. Hope.

Work of the Ship Yards.

The propeller Keweenaw, second ocean boat building at Wheeler & Co.'s yard, West Bay City, for the Atlantic coast trade will be launched in two sections. This will save the time and expense of docking the boat at Buffalo for the purpose of cutting her in two in order to get her through the St. Lawrence canals. The steamer William F. Sauber, building for Mitchell & Co., of Cleveland, at Wheeler & Co.'s will be floated about April 1 and Penoyer Bros.' boat about May 1. The steel side-wheel steamer City of Chicago will be completed about April 15. There has been fourteen feet put into her amidship. Her plating has been stripped off, frames lengthened and bilges swelled eight inches for a length of 130 feet of her midship section.

The propeller George T. Hope will come out shortly with pole spars and other general improvements that will make her equal to the best modern lake steamers. The boat's sister keelsons have been doubled, an entire new upper deck put in and heavy stringers placed underneath the main deck beams. A new 17-inch monkey rail, extra stanchions through the hold, re-flooring with 3-inch oak and 1-inch pine, iron boiler house, new house on deck around mainmast, new stacks and hatches evened up and heavily ironed are other important improvements made in the boat.

Milwaukee is to have another steamboat company, to be known as the Milwaukee & Eastern Transit Company. The concern is organized with a capital of $150,000 and may consider proposals for building. Passenger and freight business will be carried on across Lake Michigan, between Milwaukee, Holland and Benton Harbor. Henry C. Payne, P. J. Somers, Louis Auer, W. H. Osborn, B. M. Weil, Charles Kipp, John E. Coogan, A. E. Smith, Harry E. Dickinson and George S. Bartlett, all of Milwaukee, are interested in the new line.

At Ashtabula Harbor Perry White is building a steam yacht for Chief Engineer Kimball, of the Lake Shore Railway Company, the engines being furnished by Clough & Witt, Cleveland. Capt. James Devney has a tug well under way. The tug will have an engine 10x12 inches and a boiler 9x4½ feet with a 50-inch wheel

Order at Once.

A special edition of Beeson's Hand Book and Inland Marine Guide, containing a list of lake vessels, their owners and addresses, was issued for the MARINE REVIEW. The price of the book is $1, but it is furnished with the MARINE REVIEW one year for $2.50. The price of the book to those who have already subscribed for the REVIEW is 75 cents, postage paid. The copies of this work have been received. Order from the MARINE REVIEW, Cleveland, O., at once.

The Detroit and Cleveland Boats.

The first of the Detroit and Cleveland Steam Navigation Company's big steamers arrived in Cleveland on Thursday last and is now making tri-weekly trips. Both boats will be running on the Detroit-Cleveland route shortly. Operations on the Detroit-Mackinaw line are expected to begin about April 10. The old City of Detroit, which is designated as No. 1, will commence on her route between Cleveland and Put-in Bay about June 15. In connection with the steamer Frank E. Kirby, which will ply between Detroit and Put-in Bay, the latter will form a day route between Detroit and Cleveland as in former years.

Washout at the Sault.

A despatch from the Sault lake, Thursday, reports a big washout surrounding the excavations for the new lock. General Poe was called to the "Soo" by special train. Another despatch from Washington says the Craig Shipbuilding Company is the lowest bidder for the Lake Michigan light ships.

Strength of Boiler Seams.

EDITOR MARINE REVIEW:—A few days ago several marine engineers were discussing subjects pertaining to their profession, when one of the gentlemen present asked the question: "What is the proper rule for determining the strength of boiler seams?" The discussion that followed seemed to confuse rather than enlighten; some maintaining that the same rules should apply, regardless of what kind of a joint it was.

In passing examination before a board of steamboat inspectors, engineers are often asked to show the safe working pressure for a boiler of a given diameter, tensile strength and thickness of plate. The general formula used is:

RULE I. Multiply the thickness of the plate in inches by 56 per cent. of its tensile strength if the longitudinal seams are single riveted, or by 70 per cent. if the longitudinal seams are double riveted; and divide the product by the radius or half the diameter of the shell in inches.

According to this rule, if we had a boiler 54 inches in diameter, double riveted, and made of iron 5-16 inch thick, with tensile strength equal to 50,000 lbs. per square inch, the formula would be:

$$\frac{50{,}000 \times \frac{5}{16} \times .70}{27} = 405 \text{ lbs.},$$

which would be the pressure per square inch of surface that according to the rule would burst the boiler. Then using 5 as a factor of safety we have 405 div. by 5 = 81 lbs. as the safe working pressure.

It will be observed that this rule does not take into consideration the diameter or pitch of rivets, and it is therefore only valuable because it is simple.

RULE II.—Another rule is: Find the percentage of plate left after the rivet holes are punched, by this rule:

$$\frac{\text{Pitch—diameter of rivet.}}{\text{pitch of rivet.}}$$

That is, from the distance of center to center of rivets, subtract the diameter of rivet hole, and divide the remainder by the first number. The quotient is the percentage of solid plate.

Now multiply one-fifth of the tensile strength of plates by their thickness in parts of an inch, and this by the percentage of plate as found above; divide this by one-half the diameter of boiler in inches. The quotient is the safe working pressure according to this rule.

For example, we will take a boiler of the same dimensions as in Rule 1—diameter 54 inches, thickness of plates 5-16 inch, tensile strength 50,000 lbs, pitch of rivets 3⅛ inches, rivet holes ¾ inch.

Then for percentage of plate we have:

$$\frac{3\frac{1}{8} \text{ inches} - \frac{3}{4} \text{ inch}}{3\frac{1}{8} \text{ inches}} = .76$$

And for safe working pressure we find:

$$\frac{10{,}000 \times \frac{5}{16} \times .76}{27} = 88 \text{ lbs. nearly.}$$

It will be observed that by this rule we are allowed an increase of 7 lbs. per square inch more than by Rule 1, on account of taking into consideration the diameter and pitch of the rivets.

Another important point should be observed in Rule 2; it does not take into consideration the relative strength of plate and rivet sections.

RULE III.—Basing an example on a rule furnished by the scientific commission which framed the inspection law for the city of Philadelphia, we find the percentage of strength of the rivets in the seam, as compared with the strength of the solid part of the sheet as follows: Multiply the area of the hole filled by the rivet, by the number of rows of rivets in the seam, and divide the product by the pitch of the rivets multiplied by the thickness of the sheet.

For example: Diameter of rivet ¾ inch; sectional area of rivet .4417 inch; number of rows of rivets in the seam 2; pitch of rivets 3⅛ inches; thickness of plate 5-16 inch. Then for percentage of strength of rivets in the seam we have:

$$\frac{.4417 \times 2}{3\frac{1}{8} \times \frac{5}{16}} = .90 +$$

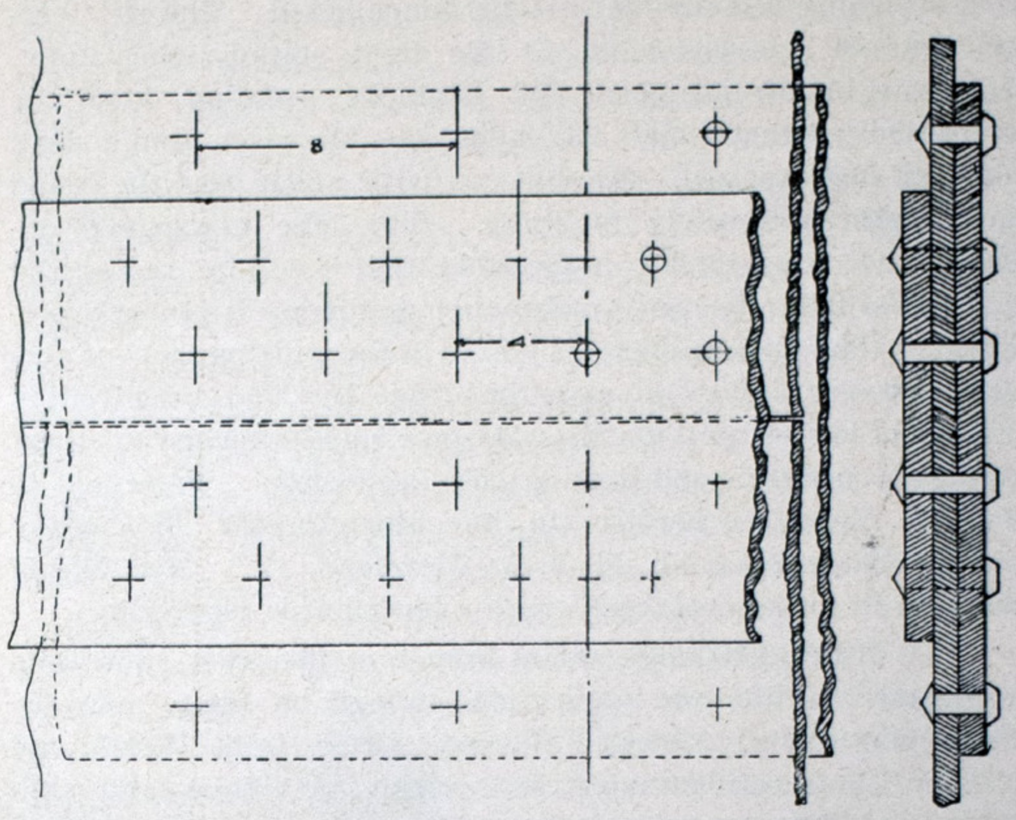
showing that in the data used in Rule 2 the rivet section is far in excess of the plate section, according to these rules.

It is assumed in Rules 2 and 3 that the boiler will fail by fracture of plates or by shearing of rivets, according to weakness in either; so that in finding the value of the seam we should take the lowest of the percentages as found by these rules.

RULE IV.—Multiply the thickness of the plates, expressed in parts of an inch, by the value of the seam as obtained in Rules 2 and 3; multiply this product by the tensile strength of the iron in the plates. Divide the last product by the internal radius of the boiler in inches, and by the factor of safety. The quotient will be the safe working pressure per square inch.

Rules 2, 3 and 4 seem to fill all the requirements for ordinary lap seams with one, two or three rows of rivets, all of equal pitch.

In the last few years, however, there has come into general use a form of boiler joint that is not entirely covered by the above rules. I refer to the triple-riveted double butt-strap joint, as shown in the accompanying drawing.



For determining the strength of this joint we will show an example based upon a rule given out by John H. Cooper, M. E.

RULE V.—Assuming the arrangements to be as shown in the cut, the pitch of the rivets in the double riveted part is 4 inches, and the outer row 8 inches. The rivet holes are 1 inch in diameter, the shell of the boiler 84 inches in diameter, the plates ¾ inch thick and have a tensile strength of 60,000 lbs. per square inch. According to Rule 2 we get for percentage of plate through outer row of rivets:

$$\frac{8 - 1}{8} = .875$$

Mr. Cooper tells us that it is not necessary to calculate the percentage of plate across the double row of rivets, as the plate could not separate there unless both the straps broke. According to rule 3 we find for a 4 inch section of joint, the following: Area of rivet hole .7854, then,

$$\frac{.7854 \times 4.5}{4.5 \times .75} = 1.0472$$

In this formula the number of rivet sections exposed to shear are taken as the number of rows of rivets in the seam. By referring to the cut it will be seen that rivets passing through the three plates present two sections for shear as one unit, while those passing through two plates present one section; and in a 4 inch section of joint there is 4½ sections of rivet exposed to shear. Therefore in a joint of this kind, the rivet sections exposed to shear would equal 4½ rivets in a 4 inch section of plate in a common lap joint, or 9 rivets in an 8 inch section of plate in a common joint.

Now, if we assume that the shearing and tensile strength of the rivets and plates are the same, we have simply to take the lowest of the percentages found by Rule 5 and apply it as the value of the seam in Rule 4; showing for safe working pressure for a boiler with proportions as shown in Rule 5

$$\frac{.75 \times .875 \times 60{,}000}{42 \times 5} = 187.5 \text{ lbs.}$$

This rule of course applies to a joint where all the parts are homogeneous. If, for instance, we wish to apply it to a joint where the shell is of steel and the rivets are of iron, we must go still further with our calculations and determine the relative strength of the different materials. But as this article is intended for engineers only, I think I have gone far enough for one trip.

MARINE ENGINEER.

When the grand lodge, E. M. B. A., met in Buffalo recently, McBean, Edge & Co. gave an exhibition with their new patent lens for signal lamps. Many of the captains expressed themselves as being well pleased, and one of them gave the following instance: "We were going into Duluth one evening when the tug captain yelled out and asked what was the matter with our lights. 'Got new kind of lens,' I replied. 'Why?' 'Why, well I'll tell you why. We have been waiting here over an hour since we first saw your lights.' The boat referred to was one of the Northern boats, and an hour's run for her equaled twelve miles at least.

"Steam launches" is the subject of a 72-page volume issued by C. P. Willard & Co., Chicago, Ill. It contains valuable information for management of small boats, machinery, boilers, etc. Send your address on a postal and recive a copy.

Around the Lakes.

Capt. Ira H. Owen, of Chicago, is in Florida.

A light-house will be erected at Portsmouth, near Kingston.

Pole spars are being put in the steamer Australasia at Toledo.

Capt. Dennis Sullivan, writing from West Bay City, says the propeller Ohio has not been sold. Neither is she being repaired.

J. L. Webster, chief engineer of the Chemung last season, has accepted the position of chief engineer of the American Steel Barge Company's fleet.

General Manager John Gordon, of the Northern Steamship Company, has also been to Puget sound and speaks very highly of the future for that region.

About 50 boat loads of wheat have been taken at Buffalo for canal shipment to New York, nearly all at 3¾ cents. There are about 130 grain boats wintering there.

Capt. P. Cusack, retired commander of lake vessels died a few days ago in Milwaukee. He at one time owned and sailed the schooner Souvenir and later the Minot Mitchell.

Underwriters refuse to take risks from Erie canal boat owners who propose to use crude oil for fuel. It is said to be unsafe except when fed to the furnace by pressure only and located some distance from the fire.

The Canadian steamboat inspectors, meeting in Toronto, granted a third class engineers' certificate to Andrew Barton and fourth class certificates to Anthony Strong, John W. Hunter, John Bolton and William A. Spencer, all of Kingston.

The Buffalo Express predicts another season of ruinous competition between the lake and all-rail lines. It is said that the Lake Shore, Michigan Central, Pennsylvania and other companies having no vessels are already threatening to make it pleasant for lake-and-rail lines.

The Philadelphia and Reading Iron and Coal Company has purchased eleven acres of dock property in Milwaukee and will erect a big plant for handling anthracite coal. Mr. F. R. Luell, of F. R. Buell & Co., has been appointed resident manager and the business of F. R. Buell & Co. has been discontinued.

It is thought that the propeller Araxes will prove a big loss to Wrecker Reid She lies sunk at the marine railway, Bay City, and his efforts so far, with the pumps that raised the Armour, to free her from water have been futile. She is said to be resting on a stone crib which has gone through her bottom.

Capt. William Jamieson, of Milwaukee, has sold the schooner George C. Houghton to William H. Marsh, of Oswego, for $8,000. The Houghton was built by Wolf and Davidson in 1873, measures 316 tons and has a Lloyd's valuation of $8,000. She was the last of the once large fleet of canal vessels hailing from Milwaukee.

John Hanson, of Superior, states that five additional ferry steamers will go to that port on the opening of navigation—two from Bay City and three from Buffalo. With the Duluth-Superior company having two boats in commission and talking of building a third one, competition will be lively at the head of the big lake.

The Buffalo Courier advances the opinion that two of the Union Line propellers as well as the six wooden boats of the Lehigh Valley Line will be allowed to remain in port on the opening of navigation, on accouut of the poor outlook for business. As far as known, no work has yet been laid out for the passenger steamer Nyack.

Three fishermen, J. P. McIntyre, Hugh McMillan, and Charles Wilson, who last season, at the risk of their own lives, rescued the crew of the barge Weeks, an American craft which was stranded on the lake shore above Point Edwards, during a furious gale, were rewarded for their bravery at a meeting of citizens in Sarnia last week. Fifty dollars in gold was presented to each of the men by the United States consul on behalf of the United States government. In making the presentation the American consul reviewed the circumstances connected with the wreck, and also said that a gold medal had been forwarded to the United States minister in England from Washington, and was to be forwarded to the Canadian government at Ottawa for Roderick Macdonald another Sarnia sailor who had saved an American lady from drowning last summer.

No Love For the Flying Dutchman.

Now begins the spring of discontent for captains and engineers. Some know what boats they are going into, but don't know whether they will have the same engineer and vice versa with the engineer, but few are unfortunate enough not to be certain of some position. Then there are changes in fleets, and there is no small rivalry on the quiet among the captains in the same line. One fleet will have two new boats added this season and, of course, two new masters have been engaged. One of the new men is from another port and brings his own engineer. Now, the stranger master is mortal, and is not feared, but his engineer is the devil and is the cause of considerable anxiety to the other three captains and their engineers. He is a Dutchman and is credited with sitting on the safety valve lever and smoking his meerschaum in order to get speed out of his engines. The Dutchman was discussed the other afternoon and one engineer talked about extravagance of crowding a boat and another said he could get everything possible out of an engine. "Yes," said one captain, "but what will you do to beat a man who gets something impossible out of his engine?"

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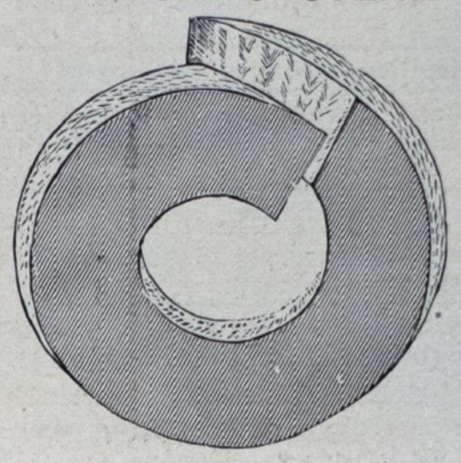

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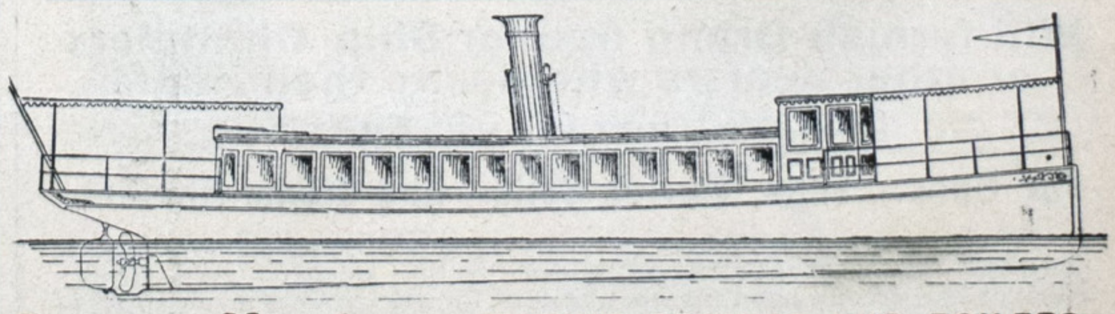

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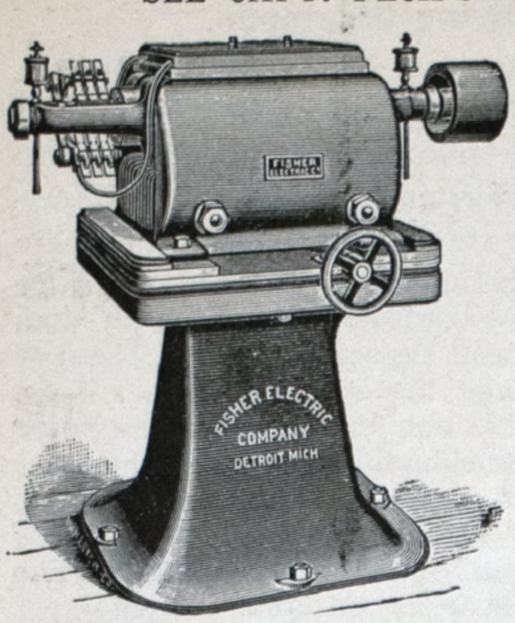
SEE CAPT. PECK'S LETTER Regarding Incandescent Lighting Plant on the Steamer S. R. KIRBY.



NORTHWESTERN TRANSPORTATION CO.

DETROIT, MICH., Oct. 7, 1890.

FISHER ELECTRIC CO.,
Detroit, Mich.,

GENTLEMEN :—Replying to your inquiry regarding the operation of the 200 Light Incandescent Plant placed on the Steamer S. R. Kirby, we wish to say that the plant has operated during the season without an interruption and has not cost us one cent. No Lamps have been broken, and we would not be without it. Very truly yours,

E. M. PECK, President.

FISHER ELECTRIC COMPANY, 183, 185 & 187 Larned St., West, DETROIT, MICH.

VESSEL AND MACHINERY EXCHANGE.

Space under this heading may be used gratis by our advertisers or subscribers to call attention to vessels or any craft, machinery, new or second hand, that they may have for sale. Those wanting machinery of any kind, or wishing to purchase vessels, are invited to take advantage of the same offer. Each item will be limited to three lines. Letters concerning same must mention number attached to item and be addressed MARINE REVIEW, 510 Perry-Payne Building, Cleveland. O.

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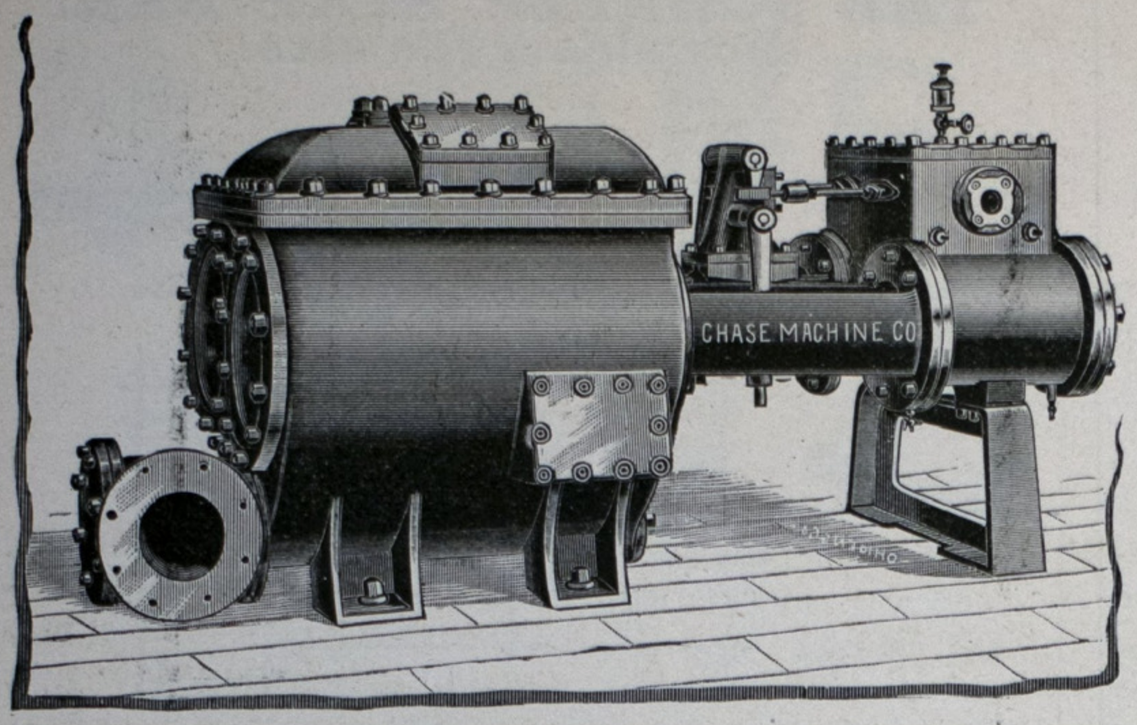

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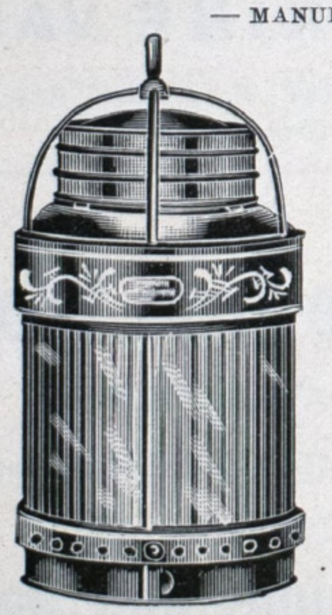

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Use only Machines that are RELIABLE; that have PROVED themselves IN ACTUAL SERVICE. 100 Boats already use them.

Cleveland, O., Jan. 6, 1891.

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GENTLEMEN: I had occasion on the 13th of November to use your Extinguisher on board the steamer Queen of the West, of Cleveland. A large lamp used for signal purposes aft, fell about twenty feet and set fire to the whole roof of the engine room. I do not know what the consequences would have been but for the prompt and effectual way in which your extinguisher put out the fire, as the wind was blowing hard and a heavy sea running at the time. I heartily recommend your machine as a fire extinguisher on all classes of steamships. Yours truly,

JOS. A. NICOLSEN, Master Str. Queen of the West.

182 24th Street,

MILLER CHEMICAL ENGINE CO. Detroit, Mich., Jan 12, 1891.

DEAR SIRS: Going up Lake Huron last fall during a heavy gale of wind and a big sea running, a fire broke out in one of the rooms of the steamer Fayette Brown, through the accidental upsetting of a lamp among some papers, and had gained considerable headway before discovered. By the prompt use of one of your Chemical Engines it was quickly subdued, and I think there was less than a pint of the fluid used. Have no doubt the fire would have given us lots of trouble without some such prompt and easy way of extinguishing it. Since that time I do not think a steamboat properly fitted out without the Miller Chemical Engine.

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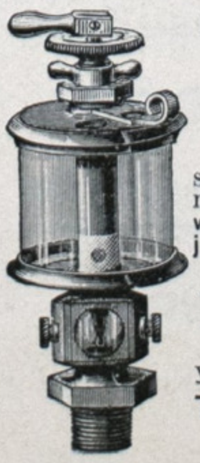

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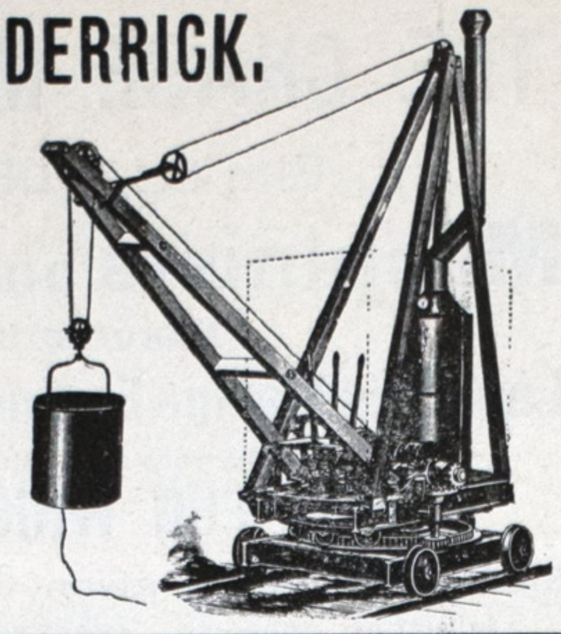
PROPOSAL FOR EXTENSION OF BREAKwater, at Buffalo Harbor. U. S. Engineer Office, Buffalo, N. Y., March 5th, 1891. Sealed proposals, in duplicate, for furnishing materials and building about 500 feet, more or less, of extension of the Breakwater at Buffalo Harbor, N.Y., will be received at this office until 2 p.m., on the 4th day of April, 1891, and opened immediately thereafter in the presence of bidders. The attention of bidders is invited to acts of Congress, of February 26th, 1885, and February 23d, 1887, vol. 23, page 332, and vol. 24, page 414, Statutes at Large. Preference will be given to articles of domestic production or manufacture, conditions of quality and price (import duties included) being equal. Specifications, general instructions to bidders and blank forms of proposal, or necessary information, will be furnished on application to this office. The United States reserves the right to reject any or all proposals. AMOS. STICKNEY, Major of Engineers, U.S.A. Apr. 2.

THE SIMMERLY DERRICK.



This Derrick makes a complete circuit either to right or left, can be used on Lighter or Steamer, and is built with or without Self-Propelling Attachment, and of any capacity desired.

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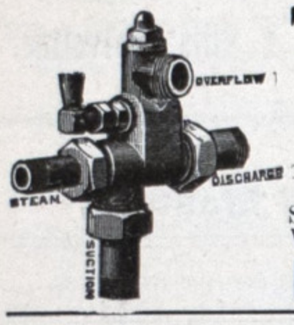

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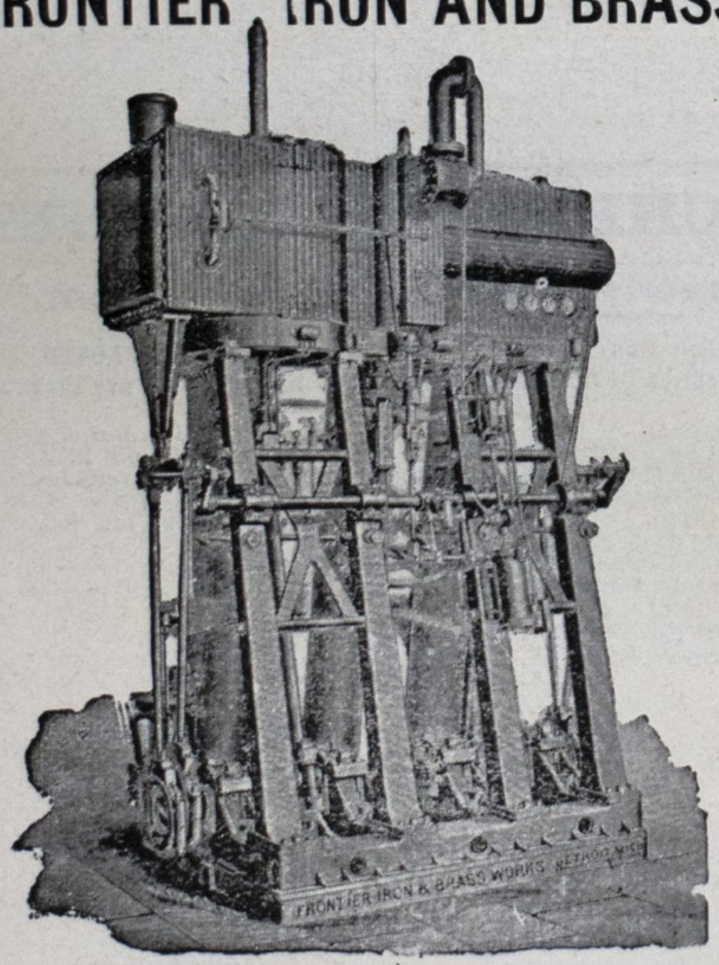

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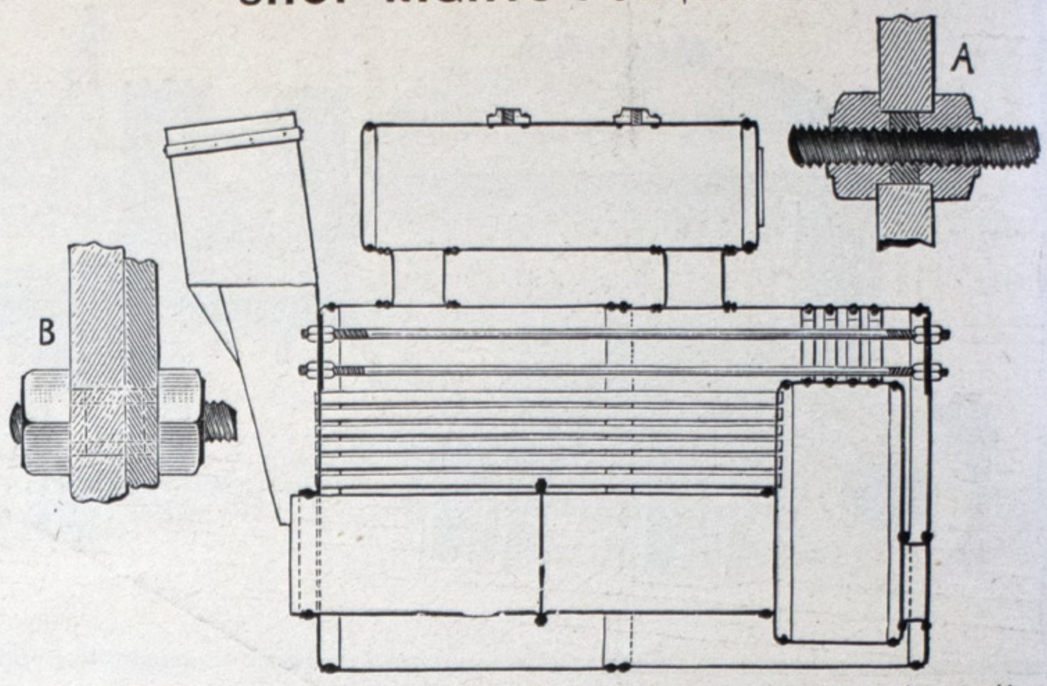

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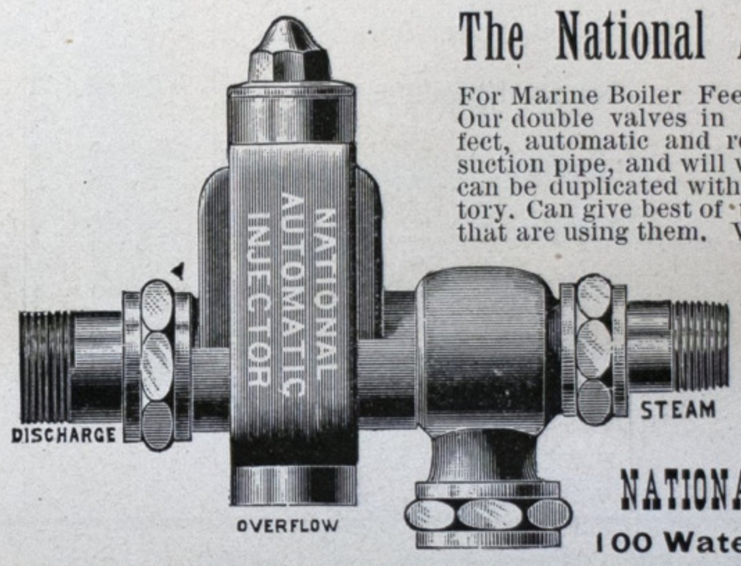

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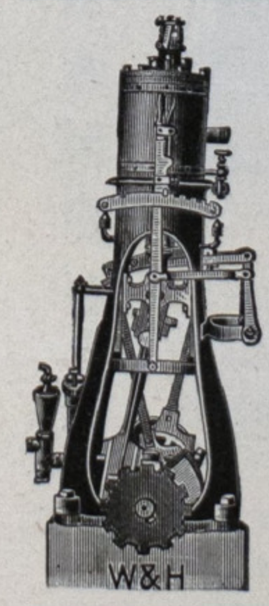

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Dock will admit vessels of 1200 tons and boxes will lift 350 ton vessels. Yard is fitted with a large spar derrick, and a stock of spars always on hand.

For dimensions of Dry Dock, see page 13.